

DIY Air Force Activities:

DNA Extraction

Materials:

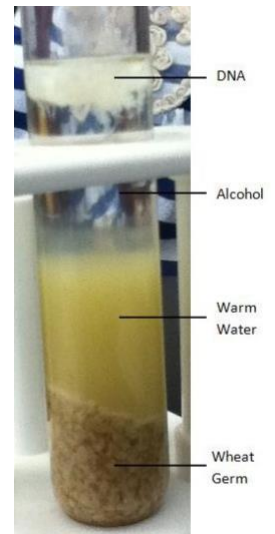
- 1 gram of raw wheat germ
- 20 mL hot water
- 1 mL dish soap
- 10 mL rubbing alcohol
- 2 vials or test tubes
- wooden skewer
- eye dropper or Pasteur pipette
- liquid measuring cup or graduated cylinder
- kitchen scale



Our DNA is like a set of human building blocks. It carries all of our genetic information. This means it defines all of our fundamental and distinctive characteristics, like our hair and eye color. It is composed of two chains that coil around one another to form a double helix. The cell's center, or nucleus, houses our DNA. If you stretched the DNA in one cell all the way out it would be nearly 2 meters long! Following the procedure below you will break open the cells of the wheat germ and separate out its DNA.

Directions:

1. Measure out 1 gram of wheat germ and place in the vial.
2. Pour in 20 mL of hot water. (check with an adult).
3. Shake vigorously (quickly) for 3 minutes.
4. Next add the 1 mL of dish soap.
5. Swirl and then flip closed vial up and down very gently for 2-3 minutes to mix. You want to minimize any bubble formation.
6. Slowly add the 10 mL of rubbing alcohol using the dropper so that the alcohol floating on top. Add the alcohol along the inner side of the vial.
7. Where the alcohol and mixture meet you will see a white substance begin to form. This is the DNA! Use the skewer to gently lift it to the top. Pour some rubbing alcohol in the second vial, then wind the DNA around the skewer to collect it and place it in the second vial to store it!



Air Force Associations:

The Air Force Research Lab at Wright Patterson Air Force Base has a human genomic and pathogen detection laboratory. Their basic mission is to utilize new and existing technologies to improve identification and possible treatment of disease. They do so with the help of manual and automated DNA extraction techniques, PCR, genetic sequencing, and biostatistical analysis.